SPECIAL.

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SOY BEANS IN THE COTTON BELT.

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INTRODUCTION.

The soy bean, also called the soja bean and the Manchurian bean, is an erect, rather hairy, leguminous plant, resembling somewhat the common field or navy bean. In China and Japan this bean is grown extensively, being used for human food, for forage, and as green manure. The soy bean is a valuable crop in various ways, and for certain conditions has many points of superiority over the cowpea that should recommend it to the average farmer. One of its most common uses is for hay, which is comparable to alfalfa and red clover in feeding value. As a pasture plant, the soy bean is especially valuable for hogs. It also makes an excellent ensilage crop with corn. The soy bean can be used to advantage for green manure, greatly increasing the supply of humus and nitrogen in the soil. The use of the seed or meal as a substitute for cottonseed or oil meal in the feeding ration has given excellent results. As a human food the soy bean should find increased favor, as it can be used in many different ways. In the growing and handling of the soy bean special labor and machinery are not necessary, the ordinary farm equipment meeting all the requirements of the crop. The high yield of seed, the excellent quality of its forage, the ease of growing and harvesting it, and its freedom from insect enemies and plant diseases should encourage the planting of this crop.

ADAPTATIONS.

The soy bean has a wide adaptation as regards soil and climatic conditions. In general, the northern limit of its adaptation in the United States may be said to be that of corn and the southern limit

Note.—Intended for farmers in the cotton belt who desire to diversify their farming because of the economic crisis which adversely affects the cotton crop at this time.

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that of cotton. In other words, it will succeed in the United States wherever corn or cotton are cultivated. It is especially adapted to the cotton belt, where the later and larger varieties, which give yields that make their extensive cultivation profitable, can be grown. Rabbits are exceedingly fond of the soy bean and often cause damage to small areas.

The soil requirements of soy beans are quite similar to those of corn, but the plants will make a satisfactory growth on poorer soil than corn. The best results, perhaps, are obtained on medium loams, although clay and sandy soils may be made to produce good crops. The soy bean does not require a well-drained soil, although a soil where water stands for a considerable length of time is not desirable. It is able to withstand a greater amount of moisture, however, than either cowpeas or corn. The soy bean is also decidedly drought resistant; much more so than the cowpea.

SOIL PREPARATION.

Soy beans succeed best on a thoroughly prepared soil. The land should be plowed early and deep, fitted, and then harrowed at intervals until the beans are planted. The young plants of soy beans are not able to push their way through a hard crust, as are corn and cowpeas. Thus, to insure a good stand, the seed should have a light covering of loose, mellow soil.

FERTILIZERS.

The use of commercial fertilizers is recommended where sandy soil predominates or the soil is of low fertility. Where fertilizers are used, good results have been obtained by using a dressing of stable manure or 200 to 300 pounds of acid phosphate and 100 pounds of muriate of potash. In using the commercial fertilizer it is well to apply broadcast before the beans are planted. Lime has been found almost invariably to increase the yield.

INOCULATION.

Soy beans, like other legumes, when well inoculated add much nitrogen to the soil. Natural inoculation now occurs quite generally throughout the soy-bean region in the southern United States. In localities where the crop has not been previously grown, however, it is advisable to inoculate. Inoculation may be most certainly secured by applying soil from an old soy-bean field, using 300 to 500 pounds of soil to the acre, or by dusting the seed with such soil before sowing.

SEEDING AND CULTIVATION.

Soy beans may be sown at any time after danger of severe frosts is over, ranging from early spring until midsummer. In the cotton region two crops of the early and medium-early varieties can be grown in a single season by planting the first early. As a rule, however, the late varieties are preferable in the South and should be planted about the same time as corn.

Soy beans are grown either in cultivated rows or broadcasted, depending on the purpose for which they are grown. The row method is preferable in weedy land and usually gives larger yields of hay and practically always of seed. The general practice for seed production is the row method, 30 to 48 inches apart. For hay, soiling, or green manure a drilled or broadcasted crop furnishes a finer quality of forage. In rows, from 20 to 30 pounds of seed to the acre are required; when sown broadcast or drilled, from 60 to 90 pounds.

Soy beans are generally drilled with an ordinary grain drill. By covering the feed cups not in use the distance between rows can be adjusted as desired. The cotton planter has also been found satisfactory for use in planting large fields. For small fields the ordinary garden drill does well.

Under proper soil conditions soy beans germinate in three to five days. As soon as the seedling plants appear above the ground cultivation may begin. Soy beans should receive at least three cultivations.

ROTATIONS.

Soy beans may be combined advantageously in many systems of crop rotation. The cash value of the seed is sufficient to encourage the growing of these beans as one of the main crops of the rotation. In the South soy beans are adapted to practically the same place in rotations as are cowpeas. In some localities a soy-bean crop is grown between two wheat crops and in other parts between two oat crops. Wheat, winter oats, and winter barley may follow soy beans. Where a whole season can be devoted to soy beans in the South two crops of early varieties can be grown in place of one late variety. By this practice much larger yields can be obtained where seed production is the object.

MIXTURES.

Soy beans may be satisfactorily grown in combination with other crops, thus affording a greater variety and a larger yield of forage. A mixture of soy beans and cowpeas makes a very satisfactory hay. Soy beans are more generally grown with corn that with any other crop. When sown in rows with sorghum or Sudan grass they have given very good results.

VARIETIES.

At the present time about 15 varieties of soy beans are handled commercially by seedsmen, the most important of which are Mammoth (late), Hollybrook (medium late), Haberlandt (medium late), Medium Yellow (medium), Ito San (early), Guelph (medium), Barchet (late), Ebony (medium late), Peking (medium late), and Wilson (medium late). All of these varieties, with the exception of Barchet, are suitable for hay and seed production. The Barchet is especially adapted for hay and green manure in the Gulf States. For seed production alone the Mammoth, Hollybrook, and Haberlandt are to be recommended, while the Wilson, Peking, and Ebony are better adapted for hay.

SOY BEANS FOR HAY.

Soy-bean hay makes a very nutritious feed and is relished by all kinds of stock. The chief value of the hay lies in its high content of digestible protein. Feeding experiments indicate that soy-bean hay is fully equal to alfalfa hay. The use of this hay, which can be grown on the farm, should reduce the quantity of feed which it is necessary to purchase.

Soy beans may be cut for hay at any time from the setting of the seed until the leaves begin to turn yellow. The crop is best fitted for hay when the pods are well formed. Soy-bean hay is cured much more readily than cowpea hay. The yields of hay range from 1 to 3 tons to the acre, and occasionally 4 tons to the acre are cut.

SOY BEANS FOR PASTURE.

The soy bean may often be utilized to advantage for pasture for all kinds of stock, the most profitable method, perhaps, being to pasture with hogs, supplementing the corn ration. Corn and soy beans may be grown together and then pastured down. In this way the crop is not only profitable in feeding value but also in the increase of soil fertility due to the manure and refuse vines.

SOY BEANS FOR SOILING.

Among soiling crops the soy bean has an important place. Having a high protein value, the crop may be fed to good advantage with less nitrogenous crops, such as corn, sorghum, and millet. The great variation in the maturity of the varieties makes it possible to have a succession of forage throughout the greater part of the summer and fall.

SOY BEANS FOR ENSILAGE.

The use of soy beans alone as ensilage is not to be recommended. Good results are reported where soy beans and corn are mixed, three parts of corn and one part of soy beans, in filling the silo. This silage keeps well, is readily eaten by stock, and the animals show good gains in flesh or milk production.

SOY BEANS FOR SEED.

Thus far soy beans have been a very profitable crop when grown for seed, but the industry has been developed mainly in a few sections, such as eastern North Carolina. The character of its growth, its uniform maturing habit, and its large yield of grain recommend the soy bean for seed production. Under ordinary conditions the best varieties of soy beans will yield from 20 to 30 bushels to the acre. The cost of producing the crop when the beans are planted in rows is generally about the same as for corn. In addition to the value of the seed, ranging from $1.25 to $2.50 per bushel, the benefit to the land on which the beans have been grown and the thrashed vines as a source of feed must be taken into consideration.

The feeding value of soy-bean seed, which contains about 35 per cent of protein, is very high and compares favorably with other concentrated feeds. For feeding to animals the seed is ground and used with some less concentrated feed. Experiments comparing soy-bean meal and cottonseed meal indicate that soy-bean meal is superior to cottonseed meal both for milk and butter production.

When grown for grain alone soy beans may be cut at any time from the yellowing of the upper leaves until all of the leaves have fallen. The plants should remain in the field until the seed is thoroughly cured. In harvesting the crop for seed a self-rake reaper or a mower with a bunching attachment will do very satisfactory work. With the taller varieties a self-binder can be used. If only a small area is grown soy beans may be cut with a sickle or pulled, tied in bundles, and flailed out when thoroughly dry.

Soy beans may be thrashed with an ordinary grain thrasher, with a few adjustments. The cylinder should be run at one-half the speed used in thrashing grain, but at the same time the usual rate should be maintained for the rest of the separator. In order to prevent splitting the beans some of the concaves should be removed. Special bean and pea separators are now on the market and do very satisfactory work. Soy beans may be thrashed in the field without previous stacking, or they may be stacked or housed and thrashed later. For the best results soy beans should be thoroughly dry for thrashing; otherwise much of the seed will remain unthrashed.

STORING SOY BEANS.

After the beans are thrashed they should be placed in shallow bins or spread out on a floor for a time. The massing of large quantities of beans, especially if they are not thoroughly dry, will cause them to heat, thus preventing germination. Under whatever conditions they are stored the seed should be examined occasionally to detect any tendency to heat. Soy beans do not retain their germinative power as well as cowpeas. Germination tests indicate that it is not advisable to sow seed two years old without previous testing.

VALUE FOR HUMAN FOOD.

Although soy beans as an article of food have attracted attention from time to time in the United States, thus far they have been but little used. The beans contain but a trace of starch and they are highly recommended as a food for persons suffering from diabetes. The numerous ways in which the soy bean can be prepared as human food should encourage its use.

The green bean when from three-fourths to full grown has been found to compare favorably with the butter or Lima bean.

The dried beans may be used like the field or navy bean in baking or in soups. When prepared in either of these ways the beans require a somewhat longer soaking and cooking.

The soy bean has been sold in this country to some extent as a coffee bean. When roasted and prepared it makes an excellent substitute for coffee.

Soy-bean meal or flour may be used as a constituent of biscuits, muffins, and bread; in fact, in any recipe where corn meal is used. In the various preparations three-fourths soy flour or meal and one-fourth wheat flour are recommended.

SOY-BEAN OIL AND CAKE.

Soy beans, in addition to their forage and food value, contain a valuable vegetable oil. The yield of oil varies to a great degree with the variety, ranging from 14 to 24 per cent. The oil is utilized to a great extent in Europe and the United States for culinary purposes, as a paint oil, in soap manufacture, and in many other industries.

The soy-bean cake, remaining after the oil is expressed, is made up into meal and makes a highly nitrogenous food. Practical experience, supplemented by careful experiments, indicates the value of the meal as a food for all kinds of live stock.

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